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Biotechnology

TOPIC: Biotechnology

TYPE: Medical Student/Resident Case Reports

MODERNA VACCINE PULMONARY EMBOLISM: ASSOCIATION VS COINCIDENCE

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INTRODUCTION: Recent case reports have called attention to cerebral venous thrombosis after receiving the Johnson & Johnson vaccine for the novel Coronavirus 2019 (COVID-19), which resulted in the temporary suspension of the single-dose viral vector option. However, as of April 13th, 2020, CDC states that there are no reports of the clotting in the approximately 180 million doses of the Pfizer and Moderna vaccines administered in the United States. Here we present a case of a healthy male who developed pulmonary embolisms after receiving the Moderna vaccine.

CASE PRESENTATION: A 55-year-old healthy, physically active male of Ashkenazi Jewish descent presents with multiple bilateral segmental and sub-segmental pulmonary embolisms. Twenty-four hours prior to onset of symptoms, the two-vaccine series of Moderna was completed. The patient was both COVID-19 PCR and COVID-19 IgG antibody negative, but positive for COVID IgM antibody. There was no evidence of deep vein thrombosis. In addition, his hypercoagulable work-up was negative.

DISCUSSION: COVID-19 dramatically increases the risk of pulmonary embolism through a proposed mechanism of thrombo-inflammation triggered by viral infection, which originates in the pulmonary vasculature. Initially it was theorized that the etiology of this patient's pulmonary embolisms were an acute COVID-19 infection but two PCR tests from two different laboratories resulted as negative. Increased clotting has not yet been reported in the Pfizer and Moderna mRNA vaccine cohorts. In fact, the preliminary data from the Moderna vaccine trial stated that risk of pulmonary embolism is less than 0.03%, which was lower than the placebo group. It is also unknown if the Moderna vaccine trial included patients of Ashkenazi Jewish descent. It is theorized that as more patients worldwide become vaccinated, major side effects could increase as those patients who were not originally represented in the preliminary studies.

CONCLUSIONS: Although the Moderna vaccine has shown to theoretically decrease the risk of clotting by decreasing risk of COVID-19 infection, as more of the world becomes vaccinated, the incidence of side effects could increase, despite preliminary data.

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